CHAPTER 3

ACTIVITY-SPECIFIC SOURCE CONTROL BMPs

This chapter describes specific BMPs for common industrial activities that may contaminate storm water. Chapter 2 led you through the steps of identifying activities at your facility that can contaminate storm water. At this point, you should be ready to choose the BMPs that best fill your facility's need. You should read this chapter if any of the activities listed below take place at your facility. BMPs for each of these activities are provided in the sections listed below:

Activity	Section
Fueling	3.1
Maintaining Vehicles and Equipment	3.2
Painting Vehicles and Equipment	3.3
Washing Vehicles and Equipment	3.4
Loading and Unloading Materials	3.5
Liquid Storage in Above-Ground Tanks	3.6
Industrial Waste Management and Outside Manufacturing	3.7
Outside Storage of Raw Materials, By-Products, or Finished Products	3.8
Salt Storage	3.9

Each section is presented in a question and answer format. By answering these questions, you will be able to quickly identify source controls or recycling BMPs that are suitable for your facility. The BMPs suggested are relatively easy to use, are inexpensive, and often are effective in removing the source of storm water contaminants. This is not a complete list of BMPs for every industrial activity; rather, it is meant to help you think about ways you can reduce storm water contamination on your site. You may want to contact one of the State or Federal pollution prevention assistance offices listed in Appendix D for suggestions or help in choosing or using these and other BMP options.

3.1 BMPs FOR FUELING STATIONS

When storm water mixes with fuel spilled or leaked onto the ground, it becomes polluted with chemicals that are harmful to humans and to fish and wildlife. The following questions will help you identify activities that can contaminate storm water and suggest BMPs to reduce or eliminate storm water contamination from fueling stations. Read this section if your facility has outdoor fueling operations or if fueling occurs in areas where leaks or spills could contaminate storm water. Also refer to the BMPs listed in Section 4.2 on Exposure Minimization.

Q. Have you installed spill and overfill prevention equipment?

Fuel overflows during storage tank filling are a major source of spills. Overflows can be prevented. Watch the transfer constantly to prevent overfilling and spilling. Overfill prevention equipment automatically shuts off flow, restricts flow, or sounds an alarm when the tank is almost full. Federal regulations require overfill prevention equipment on all Underground Storage Tanks (USTs) installed after December 1988. For USTs installed before December 1988, overfill prevention equipment is required by 1998. State or local regulations may be stricter, so contact your State and/or local government for details. Consider installing overflow prevention equipment sooner than the required deadline as part of your pollution prevention plan.

FUEL STATION ACTIVITIES THAT CAN CONTAMINATE STORM WATER:

- Spills and leaks that happen during fuel or oil delivery
- Spills caused by "topping off" fuel tanks
- Allowing rainfall on the fuel area or storm water to run onto the fuel area
- Hosing or washing down the fuel area
- Leaking storage tanks

Q. Are vehicle fuel tanks often "topped off"?

Gas pumps automatically shut off when the vehicle fuel tank is almost full to prevent spills. Trying to completely fill the tanks or topping off the tank often results in overfilling the tank and spilling fuel. Discourage topping off by training employees and posting signs.

Q. Have you taken steps to protect fueling areas from rain?

Fueling areas can be designed to minimize spills, leaks, and incidental losses of fuel, such as vapor loss, from coming into contact with rain water:

- Build a roof over the fuel area.
- Pave the fuel area with concrete instead of asphalt. Asphalt soaks up fuel or can be slowly dissolved by fuel, engine fluids, and other organic liquids. Over time, the asphalt itself can become a source of storm water contamination.

Q. Is runon to the fueling area minimized?

Runon is storm water generated from other areas that flows or "runs on" to your property or site. Runon flowing across fueling areas can wash contaminants into storm drains. Runon can be minimized by:

- Grading, berming, or curbing the area around the fuel site to direct runon away from the fuel area
- Locating roof downspouts so storm water is directed away from fueling areas
- Using valley gutters to route storm water around fueling area.

Q. Are oil/water separators or oil and grease traps installed in storm drains in the fueling area?

Oil/water separators and oil and grease traps are devices that reduce the amount of oil entering storm drains. These devices should be installed and routinely inspected, cleaned, and maintained.

Q. Is the fueling area cleaned by hosing or washing?

Cleaning the fueling area with running water should be avoided because the wash water will pick up fuel, oil, and grease and make it storm water. Consider using a damp cloth on the pumps and a damp mop on the pavement rather than a hose. Check with your local sewer authority about any treatment required before discharging the mop water or wash water to the sanitary sewer.

Q. Do you control petroleum spills?

Spills should be controlled immediately. Small spills can be contained using sorbent material such as kitty litter, straw, or sawdust. Do not wash petroleum spills into the storm drain or sanitary sewer. For more information on spill control measures, see sections on Containment Diking and Curbing in Chapter 4.

Q. Are employees aware of ways to reduce contamination of storm water at fueling stations?

Storm water contamination from fueling operations often occurs from small actions such as topping off fuel tanks, dripping engine fluids, and hosing down fuel areas. Inform employees about ways to eliminate or reduce storm water contamination.

EMPLOYEE INVOLVEMENT IS THE KEY:

Getting employees interested in reducing waste generation is the key to a successful storm water pollution prevention plan. Discuss pollution prevention with your employees. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions. Consider setting up an employee reward program to promote pollution prevention.

Q. Where does the water drain from your fueling area?

In many cases, wash water and storm water in fueling areas drain directly to the storm sewer without adequate treatment. Some types of oil/water separators installed at these locations can provide treatment to discharges from oil contaminated pavements, but this equipment is only effective when properly maintained (i.e., cleaned frequently). Some States require that these discharges be tied in to a sanitary sewer system or process wastewater treatment system. If discharges from fueling or other high risk areas at your facility drain to a sanitary sewer system, you should inform your local POTW.

SUMMARY OF FUELING STATION BMPs

- Consider installing spill and overflow protection.
- Discourage topping off of fuel tanks.
- Reduce exposure of the fuel area to storm water.
- Use dry cleanup methods for the fuel area.
- Use proper petroleum spill control.
- Encourage employee participation.

3.2 BMPs FOR VEHICLE AND EQUIPMENT MAINTENANCE

Many vehicle and equipment maintenance operations use materials or create wastes that are harmful to humans and the environment. Storm water runoff from areas where these activities occur can become polluted by a variety of contaminants such as solvents and degreasing products, waste automotive fluids, oils and greases, acids, and caustic wastes. These and other harmful substances in storm water can enter water bodies through storm drains or through small streams where they can harm fish and wildlife.

The following questions will help you find sources of storm water contamination from vehicle and equipment maintenance operations on your site and to help you choose BMPs that can reduce or eliminate these sources.

Q. Are parts cleaned at your facility?

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners are harmful and must be disposed of as a hazardous waste. Cleaning without using liquid cleaners whenever possible reduces waste. Scrape parts with a wire brush, or use a bake oven if one is available. Prevent spills and drips of solvents and cleansers to the shop floor. Do all liquid cleaning at a centralized station so the solvents and residues stay in one area. If you dip parts in liquid, remove them slowly to avoid spills. Locate drip pans, drain boards, and drying racks to direct drips back into a sink or fluid holding tank for reuse.

Q. Have you looked into using nontoxic or less toxic cleaners or solvents?

If possible, eliminate or reduce the number or amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials. For example:

- Use noncaustic detergents instead of caustic cleaning agents for parts cleaning (ask your supplier about alternative cleaning agents).
- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sanitary sewer. Contact your local sewer authority for more information.
- Replace chlorinated organic solvents (1,1,1-trichloroethane, methylene chloride, etc.) with nonchlorinated solvents. Nonchlorinated solvents like kerosene or mineral spirits are less

ACTIVITIES THAT CAN CONTAMINATE STORM WATER:
Engine repair and service: • Parts cleaning • Shop cleanup • Spilled fuel, oil, or other materials • Replacement of fluids (oil, oil filters, hydraulic fluids, transmission fluid, and radiator fluids)
Outdoor vehicle and equipment storage and parking: • Dripping engine and automotive fluids from parked vehicles and equipment
Disposal of materials or process wastes: • Greasy rags • Oil filters • Air filters • Batteries • Spent coolant, degreasers, etc.

toxic and less expensive to dispose of but are by no means harmless themselves. Check the list of active ingredients to see whether it contains chlorinated solvents.

- Choose cleaning agents that can be recycled.

Contact your supplier or trade journal for more waste minimization ideas.

Q. Are work areas and spills washed or hosed down with water?

Clean up leaks, drips, and other spills without large amounts of water. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Consider the following BMPs:

- Avoid hosing down your work areas.
- Collect leaking or dripping fluids in drip pans or containers. If different liquids are kept separate, the fluids are easier to recycle.
- Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Locate waste and recycling drums in properly controlled areas of the yard, preferably areas with a concrete slab and secondary containment.

Q. Are spills or materials washed or poured down the drain?

Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections. Used or leftover cleaning solutions, solvents, and automotive fluids and oil are often toxic and should not be put into the sanitary sewer. Be sure to dispose of these materials properly or find opportunities for reuse and recycling. If you are unsure of how to dispose of chemical wastes, contact your State hazardous waste management agency or the RCRA hotline at 1-800- 424-9346. Post signs at sinks to remind employees, and paint stencils at outdoor drains to tell customers and others not to pour wastes down drains.

Q. Are oil filters completely drained before recycling or disposal?

Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate storm water. Place the oil filter in a funnel over the waste oil recycling or disposal collection tank to drain excess oil before disposal. Oil filters can be crushed and recycled. Ask your oil supplier or recycler about recycling oil filters.

Q. Are incoming vehicles and equipment checked for leaking oil and fluids?

If possible, park vehicles indoors or under a roof so storm water does not contact the area. If you park vehicles outdoors while they await repair, watch them closely for leaks.

Put pans under leaks to collect fluids for proper recycling or disposal. Keeping leaks off the ground reduces the potential for storm water contamination and reduces cleanup time and costs. If the vehicle or equipment is to be stored outdoors, oil and other fluids should be drained first.

Designate a special area to drain and replace motor oil, coolant, and other fluids, where there are no connections to the storm drain or the sanitary sewer and drips and spills can be easily cleaned up.

Q. Are wrecked vehicles or damaged equipment stored onsite?

Be especially careful with *wrecked vehicles*, whether you keep them indoors or out, as well as with vehicles kept onsite for scrap or salvage. Wrecked or damaged vehicles often drip oil and other fluids for several days.

- As the vehicles arrive, place drip pans under them immediately, even if you believe that all fluids have leaked out before the car reaches your shop.
- Build a shed or temporary roof over areas where you park cars awaiting repairs or salvage, especially if you handle wrecked vehicles. Build a roof over vehicles you keep for parts.
- Drain all fluids, including air conditioner coolant, from wrecked vehicles and "parts" cars. Also drain engines, transmissions, and other used parts.
- Store cracked batteries in a nonleaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

BATTERY ACID SPILLS:

Handle spilled acid from broken batteries with care. If you use baking soda to neutralize spilled acid during cleanup, remember that the residue is still dangerous to handle and must be disposed of as a hazardous waste because it may contain lead and other contaminants.

Q. Do you recycle any of these materials?

- Degreasers
- Used oil or oil filters
- Antifreeze
- Cleaning solutions
- Automotive batteries
- Hydraulic fluid.

All of these materials can be either recycled at your facility or sent offsite for recycling. Some recycling options, ranked by level of effort required, follow.

Least Effort:
• Arrange for collection and transportation of car batteries, used oil and other fluids, cleaning solutions, and degreasers to a commercial recycling facility. This requires that you separate wastes and store them until they are picked up by the recycling company. • "Dirty" solvent can be reused. Presoak dirty parts in used solvent before cleaning the parts in fresh solvent.
Moderate Effort:
• Used oil, antifreeze, and cleaning solutions can be recycled onsite using a filtration system that removes impurities and allows the fluid to be reused. Filtration systems are commercially available.
Most Effort:
• Install an onsite solvent recovery unit. If your facility creates large volumes of used solvents, you may consider purchasing or leasing an onsite still to recover the solvent for reuse. Contact your State hazardous waste management agency for more information about onsite recycling of used solvents.

Q. Can you reduce the number of different solvents used?

Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents.

Q. Are wastes separated?

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from nonchlorinated solvents (like kerosene and mineral spirits). Proper labeling of all wastes and materials will help accomplish this goal (see Signs and Labels BMP).

EMPLOYEE INVOLVEMENT IS THE KEY:

Getting employees interested in reducing waste generation is the key to a successful storm water pollution prevention plan. Discuss pollution prevention with your employees. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions. Consider setting up an employee reward program to promote pollution prevention.

Q. Do you use recycled products?

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

SUMMARY OF VEHICLE MAINTENANCE AND REPAIR BMPs

- Check for leaking oil and fluids.
- Use nontoxic or low-toxicity materials.
- Drain oil filters before disposal or recycling.
- Don't pour liquid waste down drains.
- Recycle engine fluids and batteries.
- Segregate and label wastes.
- Buy recycled products.

3.3 BMPs FOR PAINTING OPERATIONS

Many painting operations use materials or create wastes that are harmful to humans and the environment. Storm water runoff from areas where these activities occur can become polluted by a variety of contaminants such as solvents and dusts from sanding and grinding that contain toxic metals like cadmium and mercury. These and other potentially harmful substances in storm water can enter water bodies directly through storm drains where they can harm fish and wildlife.

The following questions will help you identify potential sources of storm water contamination from painting operations on your site and BMPs that can reduce or eliminate these sources. Reading this section can help you eliminate, reduce, or recycle pollutants that may otherwise contaminate storm water.

Q. Is care taken to prevent paint wastes from contaminating storm water runoff?

PAINTING ACTIVITIES THAT CAN CONTAMINATE STORM WATER:
• Painting and paint removal
• Sanding or paint stripping
• Spilled paint or paint thinner

Use tarps and vacuums to collect solid wastes produced by sanding or painting. Tarps, drip pans, or other spill collection devices should be used to collect spills of paints, solvents, or other liquid materials. These wastes should be disposed of properly to keep them from contaminating storm water.

Q. Are wastes from sanding contained?

Prevent paint chips from coming into contact with storm water. Paint chips may contain hazardous metallic pigments or biocides. You can reduce contamination of storm water with paint dust and chips from sanding by the following practices:

- Avoid sanding in windy weather when possible.
- Enclose outdoor sanding areas with tarps or plastic sheeting. Be sure to provide adequate ventilation and personal safety equipment. After sanding is complete, collect the waste and dispose of it properly.
- Keep workshops clean of debris and grit so that the wind will not carry any waste into areas where it can contaminate storm water.
- Move the activity indoors if you can do so safely.

Q. Are parts inspected before painting?

Inspect the part or vehicle to be painted to ensure that it is dry, clean, and rust free. Paint sticks to dry, clean surfaces, which in turn means a better, longer-lasting paint job.

Q. Are you using painting equipment that creates little waste?

As little as 30 percent of the paint may reach the target from conventional airless spray guns; the rest is lost as overspray. Paint solids from overspray are deposited on the ground where they can contaminate storm water. Other spray equipment that delivers more paint to the target and less overspray should be used:

- Electrostatic spray equipment
- Air-atomized spray guns
- High-volume/low-pressure spray guns
- Gravity-feed guns.

Q. Are employees trained to use spray equipment correctly?

Operator training can reduce overspray and minimize the amount of paint solids that can contaminate storm water. Correct spraying techniques also reduce the amount of paint needed per job. If possible, avoid spraying on windy days. When spraying outdoors, use a drop cloth or ground cloth to collect and dispose of overspray.

Q. Do you recycle paint, paint thinner, or solvents?

These materials can either be recycled at the facility or sent offsite for recycling. Some recycling options ranked by the level of effort required follow.

Least Effort:
• Dirty solvent can be reused for cleaning dirty spray equipment and parts before equipment is cleaned in fresh solvent. • Give small amounts of left-over paint to the customer for touchup.
Moderate Effort:
• Arrange for collection and transportation of paints, paint thinner, or spent solvents to a commercial recycling facility.
Most Effort:
• Install an onsite solvent recovery unit. If your facility creates large volumes of used solvents, paint, or paint thinner, you may consider buying or leasing an onsite still to recover used solvent for reuse. Contact your State hazardous waste management agency for more information about onsite recycling of used solvents.

Q. Are wastes separated?

Separating wastes makes recycling easier and may reduce treatment costs. Keep hazardous and nonhazardous wastes separate, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from nonchlorinated solvents (like petroleum distillate and mineral spirits). Check the materials data sheet for ingredients, or talk with your waste hauler or recycling company to learn which waste types can be stored together and which should be separated.

Q. Can you reduce the number of solvents you use?

Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can do a job as well as two different solvents.

Q. Do you use recycled products?

Many products made of recycled (i.e., refined or purified) materials are available. Buying recycled paints, paint thinner, or solvent products helps build the market for recycled materials.

SUMMARY OF PAINTING OPERATION BMPs

- Inspect parts prior to painting.
- Contain sanding wastes.
- Prevent paint waste from contacting storm water.
- Proper interim storage of waste paint, solvents, etc.
- Evaluate efficiency of equipment.
- Recycle paint, paint thinner, and solvents.
- Segregate wastes.
- Buy recycled products.

3.4 BMPs FOR VEHICLE AND EQUIPMENT WASHING

Washing vehicles and equipment outdoors or in areas where wash water flows onto the ground can pollute storm water. Wash water can contain high concentrations of oil and grease, phosphates, and high suspended solid loads (these and other potentially harmful substances can pollute storm water when deposited on the ground where they can be picked up by rainfall runoff). Vehicle wash water is considered to be a process wastewater and needs to be covered by an NPDES permit. Contact your permitting authority for information about how vehicle wash water is being regulated in your area.

The following questions are designed to help you find sources of storm water contamination from vehicle and equipment washing and to select BMPs to reduce those sources. Reading this section can help you eliminate, reduce, or recycle pollutants that otherwise may contaminate storm water. Also refer to Vehicle Washing BMP in Section 4.4.

Q. Have you considered using phosphate-free biodegradable detergents?

Phosphates, which are plant nutrients, can cause excessive growth of nuisance plants in water when they enter lakes or streams in wash water. Some States ban the use of detergents containing high amounts of phosphates. Contact your supplier about phosphate-free biodegradable detergents that are available on the market.

VEHICLE AND EQUIPMENT WASHING ACTIVITIES THAT CAN CONTAMINATE STORM WATER:

- Outside equipment or vehicle cleaning (washing or steam cleaning)
- Wash water discharged directly to the ground or storm water drain

Q. Are vehicles, equipment, or parts washed over the open ground?

Used wash water contains high concentrations of solvents, oil and grease, detergents, and metals. Try not to wash parts or equipment outside. Washing over impervious surfaces like concrete, blacktop, or hardpacked dirt allows wash water to enter storm drains directly or deposits contaminants on the ground, where they are washed into storm drains when it rains. Washing over pervious ground such as sandy soils potentially can pollute ground water. Therefore, small parts and equipment washing should be done over a parts washing container where the wash water can be collected and recycled or disposed of properly.

EMPLOYEE INVOLVEMENT IS THE KEY:

Getting employees interested in reducing waste is the key to a successful storm water pollution prevention plan. Discuss pollution prevention with your employees. They are most familiar with the operations that generate wastes and may have helpful waste reduction suggestions. Consider setting up an employee award program to promote pollution prevention.

If you are washing large equipment or vehicles, and have to wash outside, designate a specific area for washing. This area should be bermed to collect the wastewater and graded to direct the wash water to a treatment facility. Consider filtering and recycling vehicle wash water. If recycling is not practical, the wastewater can be discharged to the sanitary sewer. Contact your local sewer authority to find out whether treatment is required before wash water is discharged to the sewer (pretreatment).

SUMMARY OF VEHICLE AND EQUIPMENT WASHING BMPs

- Consider use of phosphate-free detergents.
- Use designated cleaning areas.
- Consider recycling wash water.

3.5 BMPs FOR LOADING AND UNLOADING MATERIALS

Loading/unloading operations usually take place outside on docks or terminals. Materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and be carried away by rainfall runoff or when the area is cleaned. Rainfall may wash off pollutants from machinery used to unload or load materials. The following questions are designed to help you find sources of storm water contamination from loading and unloading materials and choose BMPs to reduce or eliminate those sources. Reading this section can start you on the road to eliminating, reducing, or recycling pollutants that otherwise may contaminate storm water. Also refer to the BMP on Loading and Unloading by Air Pressure or Vacuum in Section 4.2.

Q. Are tank trucks and material delivery vehicles located where spills or leaks can be contained?

Loading/unloading equipment and vehicles should be located so that leaks can be contained in existing containment and flow diversion systems.

Q. Is loading/unloading equipment checked regularly for leaks?

Check vehicles and equipment regularly for leaks, and fix any leaks promptly. Common areas for leaks are valves, pumps, flanges, and connections. Look for dust or fumes. These are signs that material is being lost during unloading/loading operations.

LOADING AND UNLOADING ACTIVITIES THAT CAN CONTAMINATE STORM WATER:

- Pumping of liquids or gases from barge, truck or rail car to a storage facility or vice versa
- Pneumatic transfer of dry chemicals to or from the loading and unloading vehicles
- Transfer by mechanical conveyor systems
- Transfer of bags, boxes, drums, or other containers by forklift, trucks, or other material handling equipment

Q. Are loading/unloading docks or areas covered to prevent exposure to rainfall?

Covering loading and unloading areas, such as building overhangs at loading docks, can reduce exposure of materials, vehicles, and equipment to rain.

Q. Are loading/unloading areas designed to prevent storm water runon?

Runon is storm water created from other areas that flows or "runs on" to your property or site. Runon flowing across loading/unloading areas can wash contaminants into storm drains. Runon can be minimized by:

- Grading, berming, or curbing the area around the loading area to direct runon away from the area
- Positioning roof down spouts so storm water is directed away from loading sites and equipment and preferably to a grassy or vegetated area where the storm water can soak into the ground.

SUMMARY OF LOADING/UNLOADING OPERATIONS BMPs

- Contain leaks during transfer.
- Check equipment regularly for leaks.
- Limit exposure of material to rainfall.
- Prevent storm water runon.

3.6 BMPs FOR LIQUID STORAGE IN ABOVE-GROUND TANKS

Accidental releases of chemicals from above-ground liquid storage tanks can contaminate storm water with many different pollutants. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. The following questions can help you find sources of storm water contamination from above-ground storage tanks and select BMPs to reduce or eliminate those sources. Also refer of the BMPs listed in Section 4.2 on exposure minimization and Section 4.3 on exposure mitigation for more information.

Q. Do storage tanks contain liquid hazardous materials, hazardous wastes, or oil?

THE MOST COMMON CAUSES OF UNINTENTIONAL RELEASES FROM TANKS:

- External corrosion and structural failure
- Installation problems
- Spills and overfills due to operator error
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- Leaks or spills during pumping of liquids or gases from barges, trucks, or rail cars to a storage facility or vice versa

Storage of oil and hazardous materials must meet specific standards set by Federal and State laws. These standards include SPCC plans, secondary containment, installation, integrity and leak detection monitoring, and emergency preparedness plans. Federal regulations set specific standards for preventing runon and collecting runoff from hazardous waste storage, disposal, or treatment areas. These standards apply to container storage areas and other areas used to store, treat, or dispose of hazardous waste. If the collected storm water is a hazardous waste, it must be managed as a hazardous waste in accordance with all applicable State and Federal environmental regulations. States may also have standards about controlling runon and runoff from hazardous waste treatment, storage, and disposal areas. To find out more about storage requirements, call the toll-free EPA RCRA hotline at 1-800-424-9346 or contact your State hazardous waste management agency.

Q. Are operators trained in correct operating procedures and safety activities?

Well-trained employees can reduce human errors that lead to accidental releases or spills.

Q. Do you have safeguards against accidental releases?

Engineered safeguards can help prevent operator errors that may cause the accidental release of pollutants. Safeguards include:

- Overflow protection devices on tank systems to warn the operator or to automatically shut down transfer pumps when the tank reaches full capacity
- Protective guards around tanks and piping to prevent vehicle or forklift damage
- Clearly tagging or labeling of valves to reduce human error.

Q. Are the tank systems inspected and is tank integrity tested regularly?

Visually inspect the tank system to identify problem areas before they lead to a release. Correct any problems or potential problems as soon as possible. An audit of a newly installed tank system by a registered and specially trained professional engineer can identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets. After installation, have operators visually inspect the tank system on a routine basis. Areas to inspect include tank foundations, connections, coatings, tank walls, and the piping system. Look for corrosion, leaks, straining of tank support structures from leaks, cracks, scratches in protective coatings, or other physical damage that may weaken the tank system. Integrity testing should be done periodically by a qualified professional.

Q. Are tanks bermed or surrounded by a secondary containment system?

A secondary containment system around both permanent and temporary tanks allows leaks to be more easily detected and contains spills or leaks. Methods include berms, dikes, liners, vaults, and double-walled tanks. See Chapter 4 for additional information on containment and spill control.

SUMMARY OF BMPs FOR LIQUID STORAGE IN ABOVE-GROUND TANKS

- Comply with applicable State and Federal laws.
- Properly train employees.
- Install safeguards against accidental releases.
- Routinely inspect tanks and equipment.
- Consider installing secondary containment.

3.7 BMPs FOR INDUSTRIAL WASTE MANAGEMENT AREAS AND OUTSIDE MANUFACTURING

Storm water runoff from areas where industrial waste is stored, treated, or disposed of can be polluted. Outside manufacturing activities can also contaminate storm water runoff. Activities such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, or operations that use hazardous materials are particularly dangerous. Wastes spilled, leaked, or lost from waste management areas or outside manufacturing activities may build-up in soils or on other surfaces and be carried away by rainfall runoff. There is also a potential for liquid wastes from lagoons or surface impoundments to overflow to surface waters or soak the soil where they can be picked up by storm water runoff. Possible storm water contaminants include toxic compounds, oil and grease, paints or solvents, heavy metals, and high levels of suspended solids.

The best way to reduce the potential for storm water contamination from both waste management areas and outside manufacturing activities is to reduce the amount of waste that is created and, consequently, the amount that must be stored or treated. The following questions are designed to help you find BMPs that can eliminate or reduce the amount or toxicity of industrial wastes as well as minimize contamination of storm water from existing waste management areas. Waste reduction BMPs are appropriate for a wide range of industries and are designed to provide ideas on ways to reduce wastes. Turn to Appendix D for a list of State and Federal pollution prevention resources that can provide more information and assistance in choosing industrial waste reduction BMPs.

Q. Have you looked for ways to reduce waste at your facility?

The first step to reducing wastes is to assess activities at your facility. The assessment is designed to find situations at your facility where you can eliminate or reduce waste generation, emissions, and environmental damage. The assessment involves steps very similar to those used to develop your Storm Water Pollution Prevention Plan, such as collecting process-specific information; setting pollution prevention targets; and developing, screening, and selecting waste reduction options for further study. Starting a waste reduction program at your facility has many potential benefits. Some of these benefits are direct (e.g., cost savings from reduced raw material use), while others are indirect (e.g., avoided waste disposal fees).

INDUSTRIAL WASTE MANAGEMENT ACTIVITIES OR AREAS THAT CAN CONTAMINATE STORM WATER:

- Landfills
- Waste piles
- Wastewater and solid waste treatment and disposal:
  - Waste pumping
  - Additions of treatment chemicals
  - Mixing
  - Aeration
  - Clarification
  - Solids dewatering
- Land application

EPA has developed a series of industry-specific pollution prevention waste minimization guidance manuals. The manuals contain steps for assessing your facility's opportunity for reducing waste and describe source reduction and recycling choices. The manuals currently available are listed in Appendix D.

Q. Have you considered waste reduction BMPs?

There are many different types of BMPs that can help eliminate or reduce the amount of industrial waste generated at your facility. Some of these BMPs are listed below and referenced in Appendix D.

- Production planning and sequencing
- Process or equipment modification
- Raw material substitution or elimination
- Loss prevention and housekeeping
- Waste segregation and separation
- Closed-loop recycling
- Training and supervision
- Reuse and recycling.

OUTSIDE MANUFACTURING ACTIVITIES OR SITUATIONS THAT CAN CONTAMINATE STORM WATER:

- Processes or equipment that generate dusts, vapors, or emissions
- Outside storage of hazardous materials or raw materials
- Dripping or leaking fluids from equipment or processes
- Liquid wastes discharged directly onto the ground or into the storm sewer

Q. Are industrial waste management and outside manufacturing areas checked often for spills and leaks?

By checking waste management areas for leaking containers or spills, you can prevent wastes from contaminating storm water. Look for containers that are rusty, corroded, or damaged. Transfer wastes from these damaged containers into safe containers. Close the lids on dumpsters to prevent rain from washing wastes out of holes or cracks in the bottom of the dumpster. In outside manufacturing areas, look for leaking equipment (e.g., valves, lines, seals, or pumps) and fix leaks promptly. Inspect rooftop and other outdoor equipment (e.g., HVAC devices, air pollution control devices, transformers, piping, etc.) for leaks or dust concentrations.

Q. Are industrial waste management areas or manufacturing activities covered, enclosed, or bermed?

The best way to avoid contaminating storm water from existing waste management and manufacturing areas is to prevent storm water runon or rain from entering or contacting these areas. This can be done by:

- Preventing direct contact with rain
- Moving the activity indoors after ensuring that all safety concerns such as fire hazard and ventilation are addressed
- Covering the area with a permanent roof

- Covering waste piles with a temporary covering material such as a reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or Hypalon
- Minimizing storm water runon by enclosing the area or building a berm around the area.

Q. Are vehicles used to transport wastes to the land disposal or treatment site equipped with anti-spill equipment?

Transport vehicles equipped with spill prevention equipment can prevent spills of wastes during transport. Examples include:

- Vehicles equipped with baffles for liquid wastes
- Trucks with sealed gates and spill guards for solid wastes
- Trucks with tarps.

Q. Do you use loading systems that minimize spills and fugitive losses such as dust or mists?

Wastes lost during loading or unloading can contaminate storm water. Vacuum transfer systems minimize waste loss.

Q. Are sediments or wastes prevented from being tracked offsite?

Wastes and sediments tracked offsite can end up on streets where they are picked up by storm water runoff. This can be avoided by using vehicles with specially designed tires, washing vehicles in a designated area before they leave the site, and controlling the wash water.

Q. Is storm water runoff minimized from the land disposal site?

You can take certain precautions to minimize the runoff of polluted storm water from land application sites. Some precautions are detailed below.

DO YOU OWN OR OPERATE A HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITY?

Federal and State laws establish strict standards for managing solid and hazardous wastes. If you are not sure whether you own or operate a hazardous waste treatment, storage, or disposal facility, call the toll-free EPA RCRA hotline at 1-800-424-9346 or contact your State hazardous waste management agency. Federal regulations contain specific standards about preventing runon and collecting runoff from hazardous waste storage, disposal, or treatment areas. These standards apply to land treatment units, landfills, waste piles, container storage areas, and other areas used to store, treat, or dispose of hazardous waste. If the collected storm water is a hazardous waste, it must be managed in accordance with all applicable State and Federal environmental regulations. States may also have standards about controlling runon and runoff from hazardous waste treatment, storage, and disposal areas.

- Choose the land application site carefully. Characteristics that help prevent runoff include slopes under 6 percent, permeable soils, a low water table, locations away from wetlands or marshes, and closed drainage systems.

- Avoid applying waste to the site when it is raining or when the ground is frozen or saturated with water. Grow vegetation on areas dedicated to land disposal to stabilize the soils and reduce the volume of surface water runoff from the site.

- Maintain adequate barriers between the land application site and receiving waters.

- Erosion control techniques might include mulching and matting, filter fences, straw bales, diversion terracing, or sediment basins. For a detailed description of erosion control techniques, see Chapter 4.

- Perform routine maintenance to ensure that erosion control or site stabilization measures are working.

SUMMARY OF INDUSTRIAL WASTE MANAGEMENT AND OUTSIDE MANUFACTURING BMPs

- Conduct a waste reduction assessment.
- Institute industrial waste source reduction and recycling BMPs.
- Prevent runoff and runon from contacting the waste management area.
- Minimize runoff from land application sites.

3.8 BMPs FOR OUTSIDE STORAGE OF RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute storm water. Storm water can become contaminated by a wide range of contaminants (e.g., metals, oil, and grease) when solid materials wash off or dissolve into water, or by spills or leaks. The following questions are designed to help you identify potential sources of storm water contamination and select BMPs that can reduce or eliminate those sources. Reading this section can help you eliminate or reduce pollutants that otherwise may contaminate storm water.

Q. Are materials protected from rainfall, runon, and runoff?

The best way to avoid contaminating storm water from outside material storage areas is to prevent storm water runon or rain from coming in contact with the materials. This can be done by:

- Storing the material indoors
- Covering the area with a roof
- Covering the material with a temporary covering made of polyethylene, polyurethane, polypropylene, or Hypalon.
- Minimizing storm water runon by enclosing the area or building a berm around the area.

ARE ANY OF THESE MATERIALS STORED OUTSIDE OR IN AREAS WHERE THEY CAN CONTAMINATE STORM WATER?

- Fuels
- Raw materials
- By-products
- Intermediates
- Final products
- Process residuals

SUMMARY OF BMPs FOR OUTSIDE STORAGE OF RAW MATERIALS, BY-PRODUCTS, OR FINISHED PRODUCTS

- Cover or enclose materials.

3.9 BMPs FOR SALT STORAGE FACILITIES

Salt left exposed to rain or snow can be lost. Salt spilled or blown onto the ground during loading and unloading will dissolve in storm water runoff. Storm water contaminated with salt can be harmful to vegetation and aquatic life. Salty storm water runoff soaking into the ground may contaminate ground water and make it unsuitable as a drinking water supply. The following BMPs will help reduce storm water contamination from salt storage and transfer activities. See Chapter 4 for more detailed information on covering storage areas.

Q. Are salt piles protected from rain?

The best way to prevent salt from contaminating storm water is to eliminate or limit the exposure of salt to rain. Preventing contact with rain also protects against salt loss and prevents salt from absorbing moisture and becoming caked or lumpy and making it difficult to handle and use.

- Store salt under a roof. This is the best way to stop direct contact with rain.

SALT STORAGE ACTIVITIES THAT CAN CONTAMINATE STORM WATER:

- Salt stored outside in piles or bags that are exposed to rain or snow
- Salt loading and unloading areas located outside or in areas where spilled salt can contaminate storm water.

If salt must be stored outside:

- Build the storage pile on asphalt to reduce the potential for ground water contamination
- Cover the pile with a temporary covering material such as polyethylene, polyurethane, polypropylene, or Hypalon.

Q. Is storm water runon prevented from contacting storage piles and loading and unloading areas?

Storm water runon can be minimized by enclosing the area or building berms around storage, loading, and unloading areas.

SUMMARY OF SALT STORAGE FACILITIES BMPs

- Put it under a roof.
- Use temporary covers.
- Enclose or berm transfer areas.